

ABSTARCT OF THE DISCLOSURE

The present invention provides a method for manufacturing a stacked gate structure in a semiconductor device. The method includes the steps of sequentially forming a gate dielectric layer, a poly-silicon layer, a metal layer, a barrier layer, and a tungsten layer on a semiconductor substrate, carrying out a rapid thermal annealing (RTA) in a nitrogen ambient, forming a silicon nitride layer on the tungsten layer, and patterning the multilayer thin-film structure into a predetermined configuration.